Fig. 1

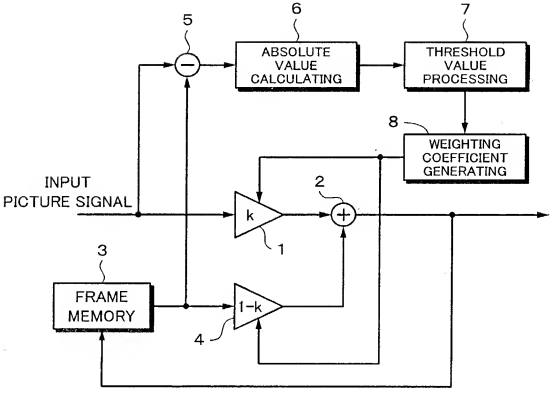

5
6
7
ABSOLUTE VALUE CALCULATING
THRESHOLD VALUE PROCESSING
8
WEIGHTING COEFFICIENT GENERATING
INPUT PICTURE SIGNAL
2
k
1
3
FRAME MEMORY
1-k
4

Fig. 2

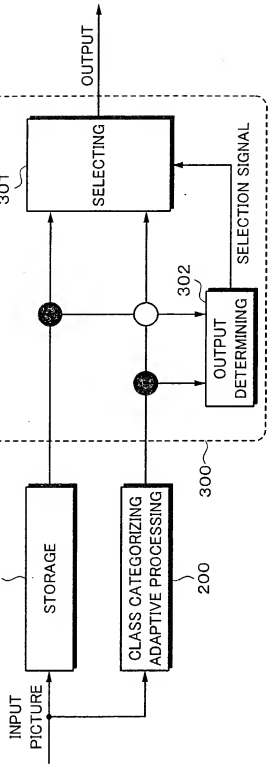

INPUT PICTURE
100
STORAGE
CLASS CATEGORIZING ADAPTIVE PROCESSING
200
300
301
SELECTING
OUTPUT
302
OUTPUT DETERMINING
SELECTION SIGNAL

Fig. 3

INPUT PICTURE SIGNAL
11
MOTION ADAPTIVE TYPE RECURSIVE FILTER
12
CLASS CATEGORIZING ADAPTIVE NOISE ELIMINATING
13
DELAYING
15
16
SELECTING
14
STILL PORTION-MOVING PORTION DETERMINING CIRCUIT
DIFFERENCE VALUE CALCULATING
141
ABSOLUTE VALUE CALCULATING
142
COMPARING AND DETERMINING
143

Fig. 4

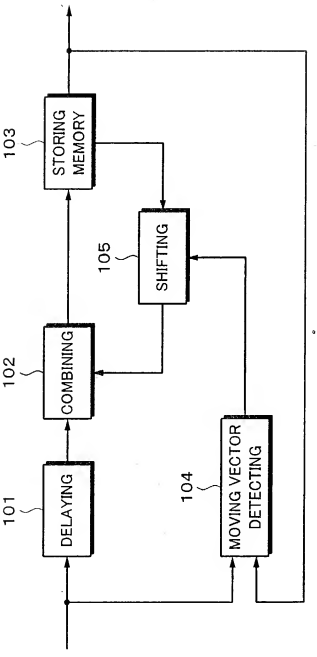

101
DELAYING
102
COMBINING
103
STORING MEMORY
104
MOVING VECTOR DETECTING
105
SHIFTING

Fig. 5

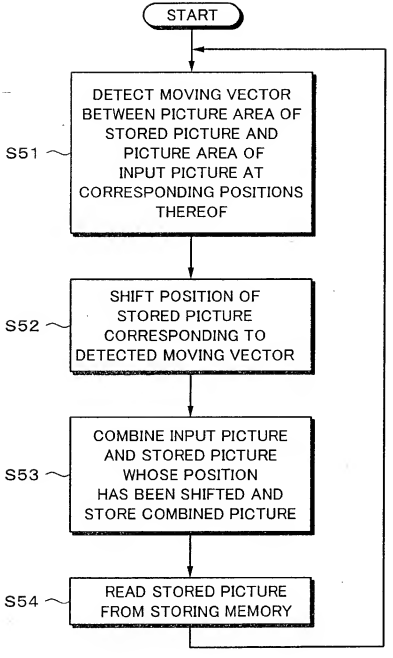

START
DETECT MOVING VECTOR BETWEEN PICTURE AREA OF STORED PICTURE AND PICTURE AREA OF INPUT PICTURE AT CORRESPONDING POSITIONS THEREOF
S51
SHIFT POSITION OF STORED PICTURE CORRESPONDING TO DETECTED MOVING VECTOR
S52
COMBINE INPUT PICTURE AND STORED PICTURE WHOSE POSITION HAS BEEN SHIFTED AND STORE COMBINED PICTURE
S53
READ STORED PICTURE FROM STORING MEMORY
S54

Fig. 6

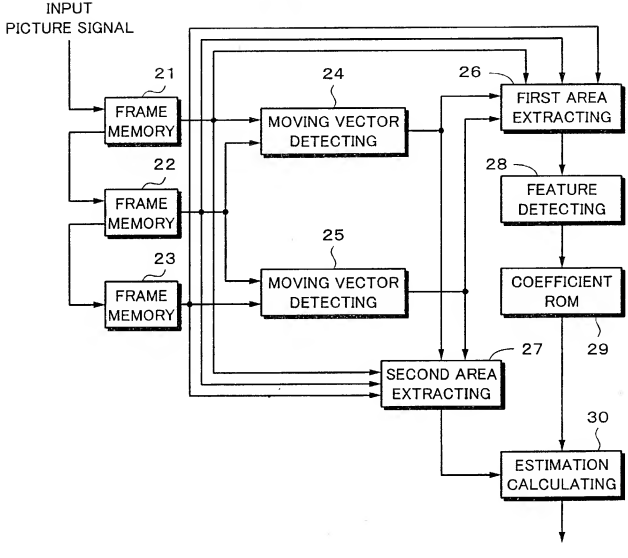

INPUT
PICTURE SIGNAL
21
FRAME
MEMORY
22
FRAME
MEMORY
23
FRAME
MEMORY
24
MOVING VECTOR
DETECTING
25
MOVING VECTOR
DETECTING
26
FIRST AREA
EXTRACTING
28
FEATURE
DETECTING
COEFFICIENT
ROM
29
27
SECOND AREA
EXTRACTING
30
ESTIMATION
CALCULATING

Fig. 7A

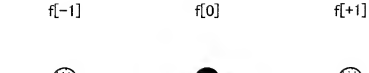


Fig. 7B

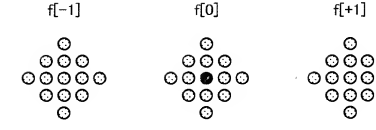


Fig. 7C

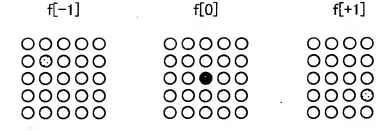


Fig. 7D

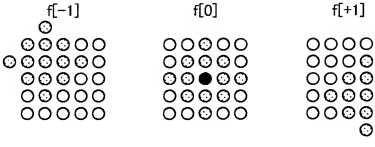


Fig. 7E

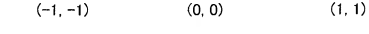


Fig. 8

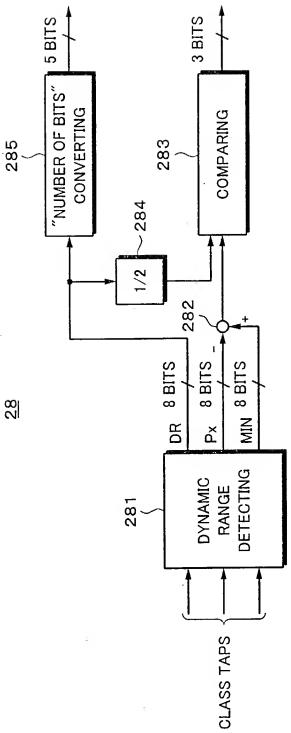

28
281
DYNAMIC RANGE DETECTING
CLASS TAPS
DR 8 BITS
Px 8 BITS
MIN 8 BITS
282
-
+
283
COMPARING
3 BITS
284
1/2
285
"NUMBER OF BITS" CONVERTING
5 BITS

Fig. 9

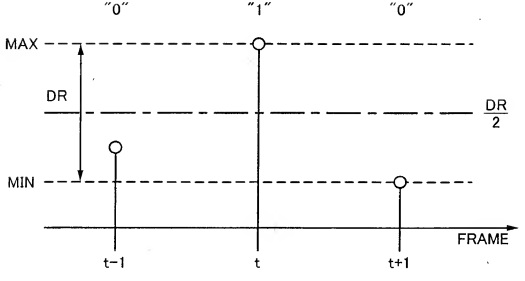


Fig. 10

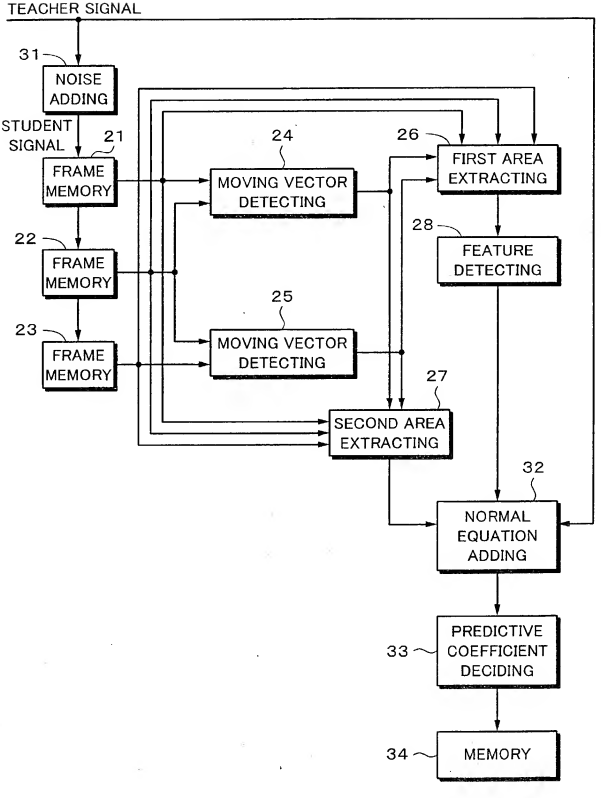

TEACHER SIGNAL
31
NOISE ADDING
STUDENT SIGNAL
21
FRAME MEMORY
22
FRAME MEMORY
23
FRAME MEMORY
24
MOVING VECTOR DETECTING
25
MOVING VECTOR DETECTING
26
FIRST AREA EXTRACTING
28
FEATURE DETECTING
27
SECOND AREA EXTRACTING
32
NORMAL EQUATION ADDING
33
PREDICTIVE COEFFICIENT DECIDING
34
MEMORY

Fig. 11

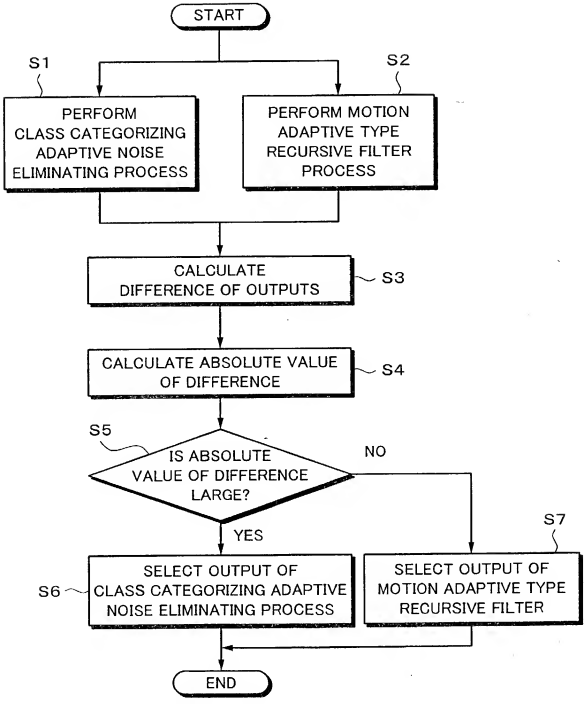

START
S1
S2
PERFORM CLASS CATEGORIZING ADAPTIVE NOISE ELIMINATING PROCESS
PERFORM MOTION ADAPTIVE TYPE RECURSIVE FILTER PROCESS
CALCULATE DIFFERENCE OF OUTPUTS
S3
CALCULATE ABSOLUTE VALUE OF DIFFERENCE
S4
S5
IS ABSOLUTE VALUE OF DIFFERENCE LARGE?
NO
YES
S7
S6
SELECT OUTPUT OF CLASS CATEGORIZING ADAPTIVE NOISE ELIMINATING PROCESS
SELECT OUTPUT OF MOTION ADAPTIVE TYPE RECURSIVE FILTER
END

Fig. 12

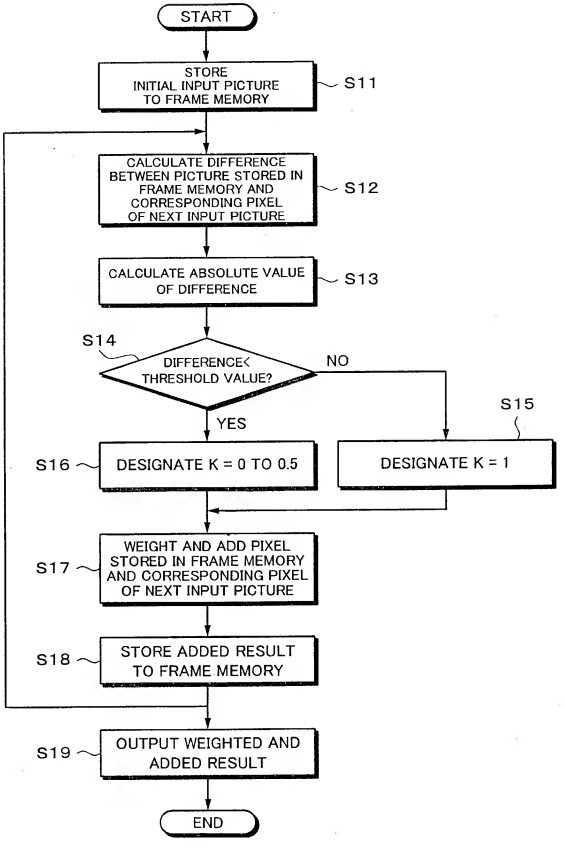

START
STORE INITIAL INPUT PICTURE TO FRAME MEMORY
S11
CALCULATE DIFFERENCE BETWEEN PICTURE STORED IN FRAME MEMORY AND CORRESPONDING PIXEL OF NEXT INPUT PICTURE
S12
CALCULATE ABSOLUTE VALUE OF DIFFERENCE
S13
S14
DIFFERENCE< THRESHOLD VALUE?
NO
YES
S15
S16
DESIGNATE K = 0 TO 0.5
DESIGNATE K = 1
S17
WEIGHT AND ADD PIXEL STORED IN FRAME MEMORY AND CORRESPONDING PIXEL OF NEXT INPUT PICTURE
S18
STORE ADDED RESULT TO FRAME MEMORY
S19
OUTPUT WEIGHTED AND ADDED RESULT
END

Fig. 13

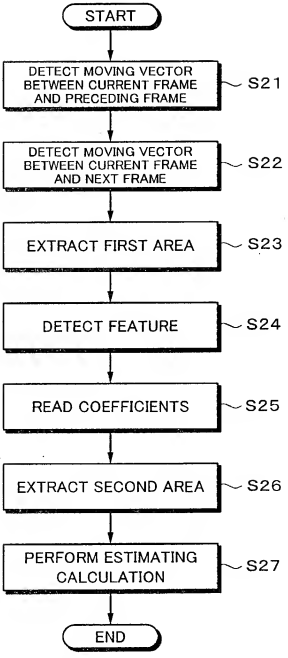

START
DETECT MOVING VECTOR BETWEEN CURRENT FRAME AND PRECEDING FRAME
S21
DETECT MOVING VECTOR BETWEEN CURRENT FRAME AND NEXT FRAME
S22
EXTRACT FIRST AREA
S23
DETECT FEATURE
S24
READ COEFFICIENTS
S25
EXTRACT SECOND AREA
S26
PERFORM ESTIMATING CALCULATION
S27
END

Fig. 14

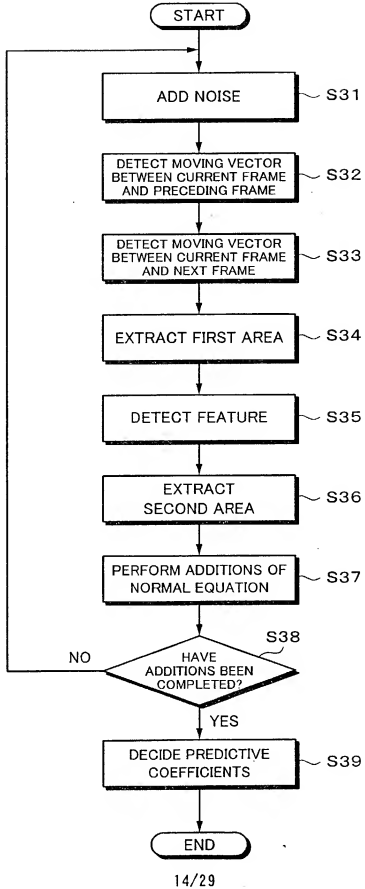

START
ADD NOISE
S31
DETECT MOVING VECTOR BETWEEN CURRENT FRAME AND PRECEDING FRAME
S32
DETECT MOVING VECTOR BETWEEN CURRENT FRAME AND NEXT FRAME
S33
EXTRACT FIRST AREA
S34
DETECT FEATURE
S35
EXTRACT SECOND AREA
S36
PERFORM ADDITIONS OF NORMAL EQUATION
S37
S38
HAVE ADDITIONS BEEN COMPLETED?
NO
YES
DECIDE PREDICTIVE COEFFICIENTS
S39
END

Fig. 15

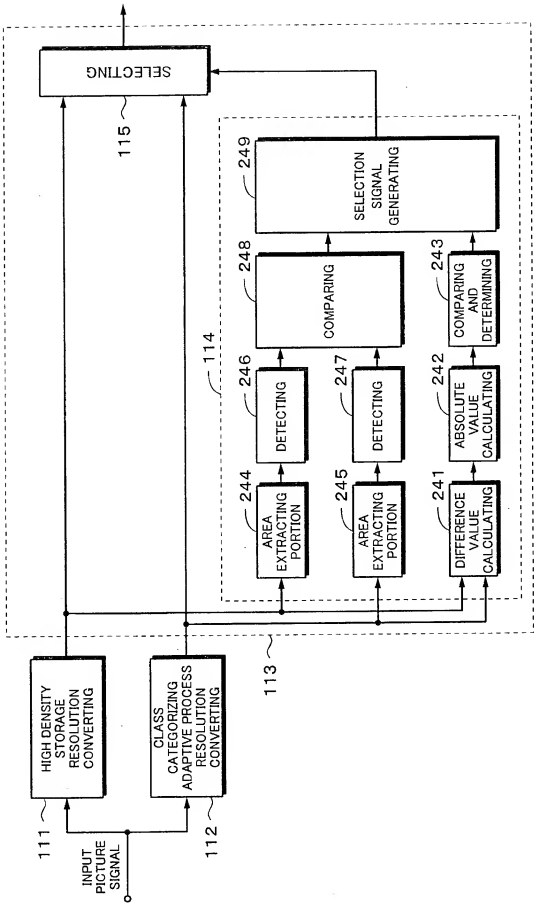

INPUT PICTURE SIGNAL
111
HIGH DENSITY STORAGE RESOLUTION CONVERTING
112
CLASS CATEGORIZING ADAPTIVE PROCESS RESOLUTION CONVERTING
113
114
AREA EXTRACTING PORTION
244
DETECTING
246
AREA EXTRACTING PORTION
245
DETECTING
247
DIFFERENCE VALUE CALCULATING
241
ABSOLUTE VALUE CALCULATING
242
COMPARING AND DETERMINING
243
COMPARING
248
SELECTION SIGNAL GENERATING
249
115
SELECTING

Fig. 16

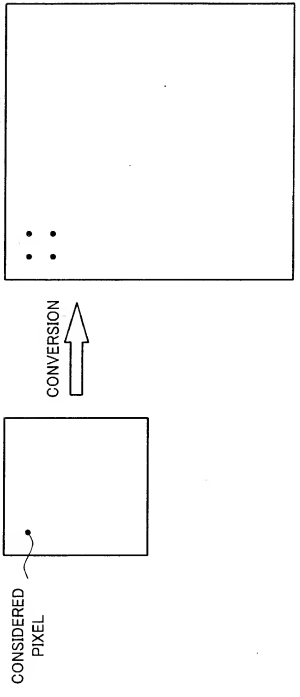


Fig. 17

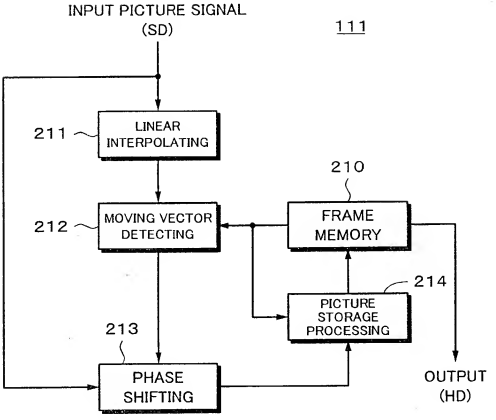


Fig. 18A

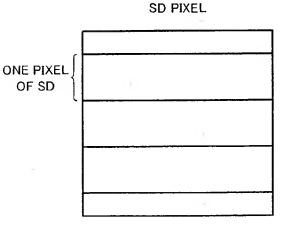


Fig. 18B

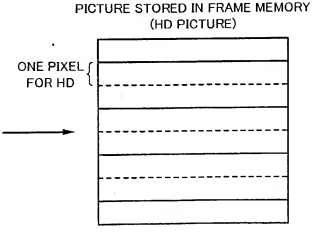


Fig. 19A Fig. 19B Fig. 19C

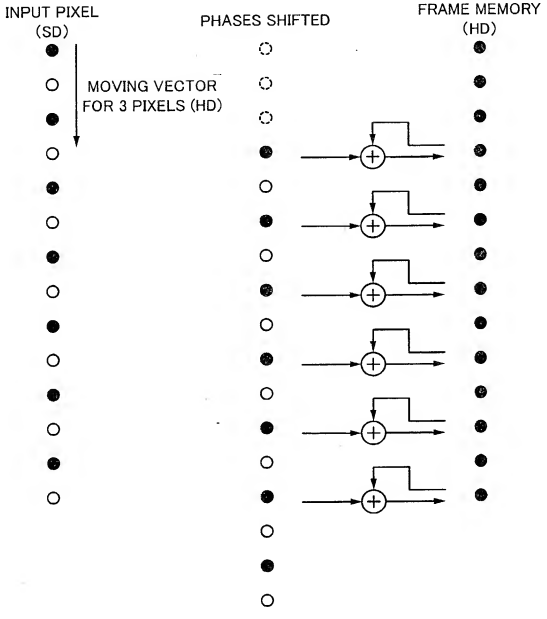


Fig. 20

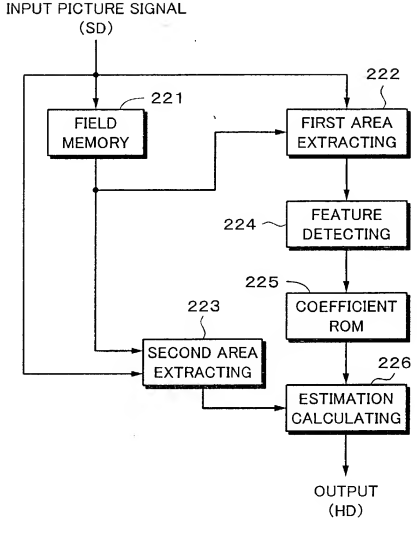


Fig. 21A

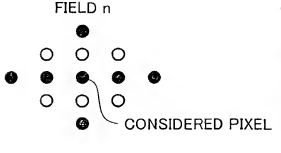


Fig. 21B

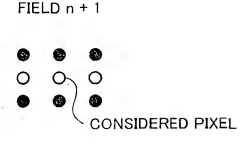


Fig. 22

224
CLASS TAPS
121
DYNAMIC RANGE DETECTING
DR 8 BITS
Px 8 BITS
MIN 8 BITS
122
+
-
123
COMPARING
13 or 9 BITS
124
1/2
125
"NUMBER OF BITS" CONVERTING
5 BITS

Fig. 23

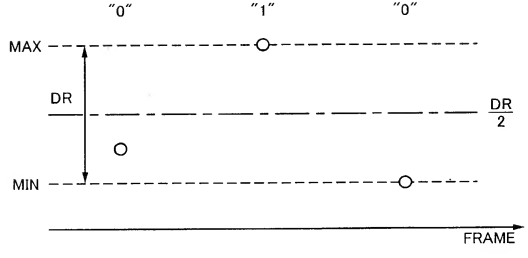


Fig. 24

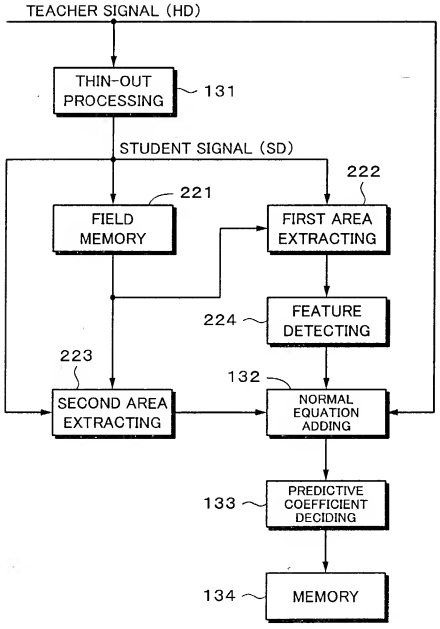

TEACHER SIGNAL (HD)
THIN-OUT PROCESSING
131
STUDENT SIGNAL (SD)
221
222
FIELD MEMORY
FIRST AREA EXTRACTING
224
FEATURE DETECTING
223
132
SECOND AREA EXTRACTING
NORMAL EQUATION ADDING
133
PREDICTIVE COEFFICIENT DECIDING
134
MEMORY

Fig. 25A

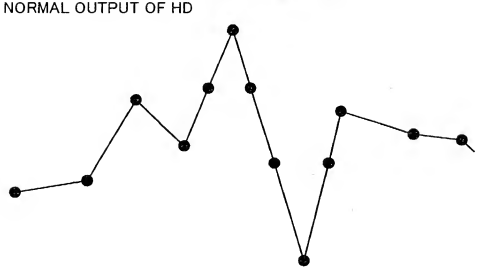


Fig. 25B

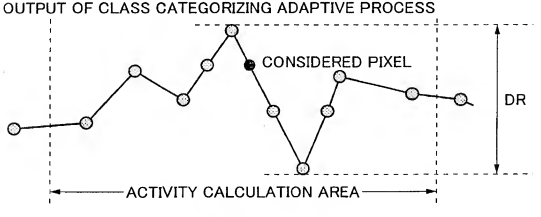


Fig. 25C

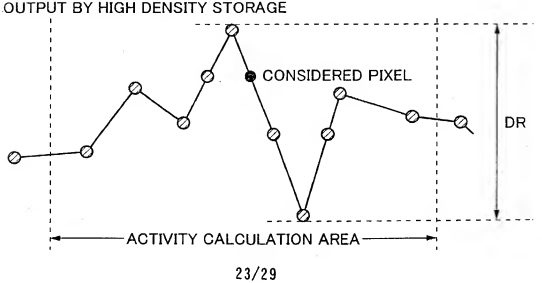


Fig. 26

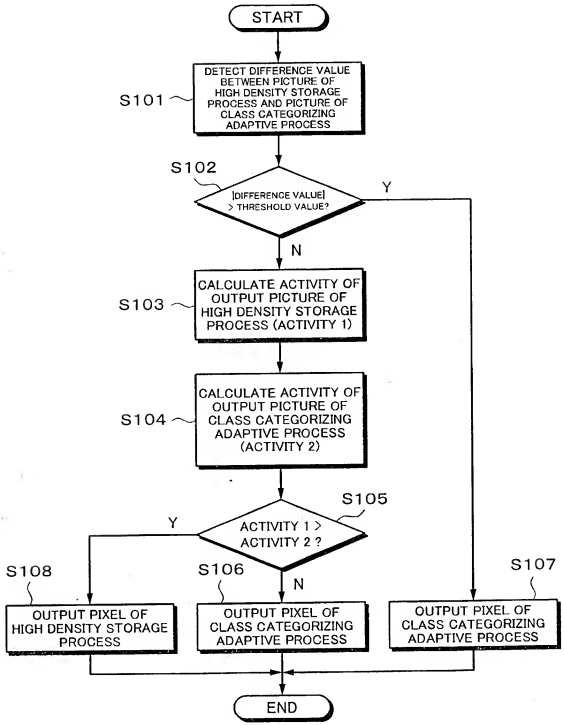

START
S101
DETECT DIFFERENCE VALUE BETWEEN PICTURE OF HIGH DENSITY STORAGE PROCESS AND PICTURE OF CLASS CATEGORIZING ADAPTIVE PROCESS
S102
|DIFFERENCE VALUE| > THRESHOLD VALUE?
Y
N
S103
CALCULATE ACTIVITY OF OUTPUT PICTURE OF HIGH DENSITY STORAGE PROCESS (ACTIVITY 1)
S104
CALCULATE ACTIVITY OF OUTPUT PICTURE OF CLASS CATEGORIZING ADAPTIVE PROCESS (ACTIVITY 2)
S105
ACTIVITY 1 > ACTIVITY 2 ?
Y
N
S108
OUTPUT PIXEL OF HIGH DENSITY STORAGE PROCESS
S106
OUTPUT PIXEL OF CLASS CATEGORIZING ADAPTIVE PROCESS
S107
OUTPUT PIXEL OF CLASS CATEGORIZING ADAPTIVE PROCESS
END

Fig. 27

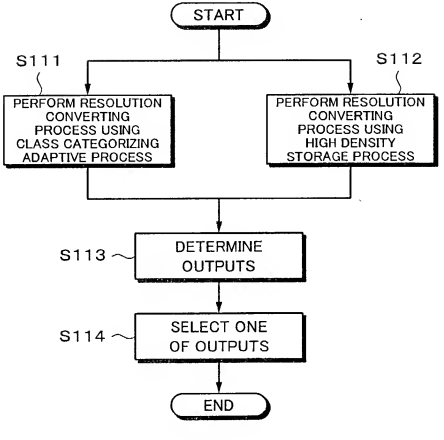

START
S111
S112
PERFORM RESOLUTION CONVERTING PROCESS USING CLASS CATEGORIZING ADAPTIVE PROCESS
PERFORM RESOLUTION CONVERTING PROCESS USING HIGH DENSITY STORAGE PROCESS
S113
DETERMINE OUTPUTS
S114
SELECT ONE OF OUTPUTS
END

Fig. 28

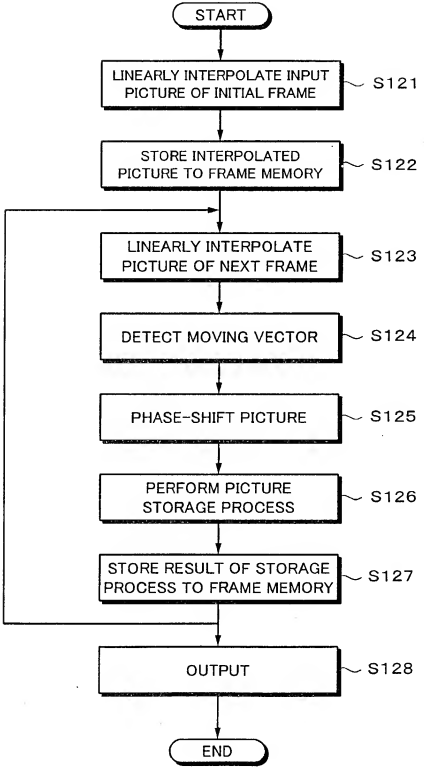

START
LINEARLY INTERPOLATE INPUT PICTURE OF INITIAL FRAME
S121
STORE INTERPOLATED PICTURE TO FRAME MEMORY
S122
LINEARLY INTERPOLATE PICTURE OF NEXT FRAME
S123
DETECT MOVING VECTOR
S124
PHASE-SHIFT PICTURE
S125
PERFORM PICTURE STORAGE PROCESS
S126
STORE RESULT OF STORAGE PROCESS TO FRAME MEMORY
S127
OUTPUT
S128
END

Fig. 29

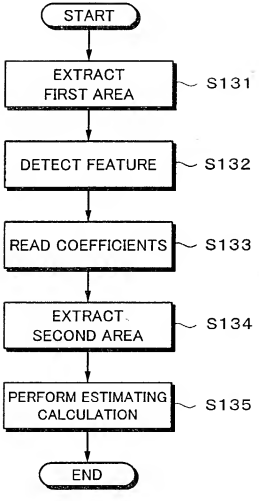
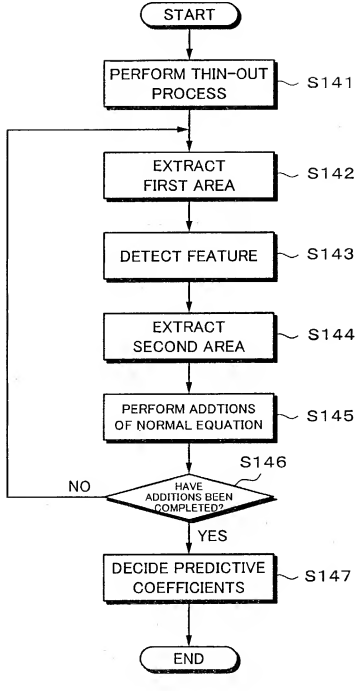

START
EXTRACT FIRST AREA
S131
DETECT FEATURE
S132
READ COEFFICIENTS
S133
EXTRACT SECOND AREA
S134
PERFORM ESTIMATING CALCULATION
S135
END

Fig. 30


START
PERFORM THIN-OUT PROCESS
S141
EXTRACT FIRST AREA
S142
DETECT FEATURE
S143
EXTRACT SECOND AREA
S144
PERFORM ADDTIONS OF NORMAL EQUATION
S145
S146
HAVE ADDITIONS BEEN COMPLETED?
NO
YES
DECIDE PREDICTIVE COEFFICIENTS
S147
END

DESCRIPTION OF REFERENCE NUMERALS

3	FRAME MEMORY
8	WEIGHTING COEFFICIENT GENERATING CIRCUIT
11	MOTION ADAPTIVE TYPE RECURSIVE FILTER
12	CLASS CATEGORIZING ADAPTIVE NOISE ELIMINATING CIRCUIT
13	OUTPUT SELECTING PORTION
14	STILL PORTION - MOVING PORTION DETERMINING CIRCUIT
100	FIRST SIGNAL PROCESSING PORTION
200	SECOND SIGNAL PROCESSING PORTION
111	HIGH DENSITY STORAGE RESOLUTION CONVERTING CIRCUIT
112	CLASS CATEGORIZING ADAPTIVE PROCESS RESOLUTION CONVERTING CIRCUIT
113	OUTPUT SELECTING PORTION
114	DETERMINING CIRCUIT
210	FRAME MEMORY
212	MOVING VECTOR DETECTING PORTION
213	PHASE SHIFTING PORTION